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Description of DE4330335

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The invention concerns a spraying device for Flaschenreinigungsmaschinen in accordance with the generic term of the requirement 1.

Spraying devices for Flaschenreinigungsmaschinen are well-known in different versions. The jet arrangements are arranged, in particular either being certain in the machines in the case of intermittent bottle transport, or they are mobile and the bottles are adjusted, in particular in the case of continuous bottle transport. By the nozzles lying usually outside of the bottle delta an individual jet spray from caustic solution or water is introduced in the bottle inside, which the soil and/or the side panel of the bottle with pressure hits (DE 24 02 630 A1).

For increase of the cleaning efficiency jet arrangements were already suggested, which introduce at the same time two separate jet sprays under different angles in the bottle inside, both with being certain jet arrangements and/or. Spritzrohren (GB 514,293) and with genericin accordance with-eaten jet arrangements with swivelling. Nozzle waves (DE 39 25 725 C2).

Finally it is already well-known with being certain jet arrangements to begin for the external cleaning of the bottle neck several under a pointed angle one on the other to bent spraying nozzles of them strongly kegelige jet sprays in the range of the bottle delta if necessary. partial meet one another (DE 19 39 995). An improvement of the internal cleaning of the bottles is thereby not possible.

The task is appropriate for the invention to reason to increase during an genericin accordance with-eaten spraying device with several mobile jet sprays with simple means the internal cleaning effect noticeably so that also bottles with strongly water-rejecting surfaces, in particular plastic bottles, can be cleaned intensively.

This task is solved according to invention by the characteristics indicated in the requirement 1.

During a device according to invention consciously an occasional contact of the jet sprays in the bottle inside is caused. It was surprisingly shown that by in such a way produced diversion, turbulence and scatter of the jet sprays an intensive wetting and spraying of the bottle inside become possible. This is important special for the cleaning of bottles with water-repellent surfaces, like z. B. PET bottles.

Additionally to the scattering effect of the affecting jet sprays also the high kinetic energy of a single jet comes in only one spraying station to the effect.

In addition swivelling spraying nozzles have a particularly high self cleaning effect due to the continual reversal of the direction of flow, so that even after longer actual working time an accurate adherence to the jet directions is ensured.

Favourable training further of the invention, which all contribute to a high effectiveness of the bottle internal cleaning, are indicated in the Unteransprüchen.

▲ top In the being inferior a remark example of the invention is described on the basis the designs. Show:

Fig. 1 the plan view on a spraying device,

Fig. 2 the cut of A-B by the spraying device after Fig. 1,

Fig. 3a to 3e different phases of a spraying procedure of the spraying device after the Fig. 1 and 2 in schematic representation.

The spraying device 1 after Fig. 1 and 2 exhibits a Spritzrohr 9 with rectangular cross section, which is fastened in horizontal situation in a not far Flaschenreinigungsmaschine shown. The Spritzrohr 9 sits with distance under the horizontal path downward of the bottles 6 pointing with their delta, as she is defined by the bottle baskets developed bottle promoter 13 of the Flaschenreinigungsmaschine fastened from two endless chains also to it. Via a line 17 and a not pump shown is supplied the Spritzrohr 9 with a spraying liquid, for example hot caustic solution.

At the top side of the Spritzrohres 9 aligned transverse to the direction of motion of the Flaschenförderes 13 indicated by an arrow two parallel nozzle waves are swivelling stored 7, 8 in several double clevis mountings 16 with small distance. Each clevis mounting 16 points two spraying openings 14, 15 and at its lower surface two tax and supplying openings 18, 19 at its top side up, with the inside of the Spritzrohres 9 in connection. Each nozzle wave 7, 8 is in the range of each clevis mounting 16 with two cheek by jowl lying, over 90 degrees against each other nozzle bores 2 and/or. 3 provided, those with the spraying openings 14, 15 and the tax openings 18, 19 in cover is bringable, if the nozzle waves 7, 8 turn in direction of arrow. The two pairs of crossed nozzle bores 2 and/or. 3 of a double clevis mounting 16 forms in each case a spraying place for a bottle 6 and/or. a jet arrangement, of which several are intended, according to the number of bottles 6 in a Flaschenkorb.

At the opposite ends of the two nozzle waves 7, 8 in each case a vierarmiger Rollenstern 10, 11 is fastened, which

controls the turn of its nozzle wave 7, 8 together with appropriate notices 12 at the bottle promoter 13. The expiration of this turn and thus a spraying procedure becomes in the being inferior on the basis the Fig. 3a to 3e described, which shows the same spraying place, in an educated manner by a clevis mounting 16 and the associated jet arrangement 2, 3 at different times during a spraying procedure.

In the dwell phase not shown between two spraying procedures are all four nozzle bores 2, 3 of a spraying place and/or. Jet arrangement outside of the tax openings 18, 19 and are thus switched off. If a bottle 6 with the continuously rotating bottle promoter 13 of the spraying device 1 approaches, then the appropriate notice 12 of the bottle promoter 13 meets a role of the Rollensterns 10 of the front nozzle wave 7 and begins these in the clockwise direction to turn. The nozzle bore 2 lying in front in line of sight arrives into the range of their tax opening 18 and sends a bundled jet spray 4 diagonally by the bottle delta against the bottle wall (Fig. 3a). In the further process of the turn of the nozzle wave 7 the jet spray 4 at the bottle wall moves along upward to the bottle soil (Fig. 3b). Now the notice 12 arranged at the opposite side of the bottle promoter 13 meets against a role of the Rollensterns 11 of the rear nozzle wave 8, so that also this begins to rotate in the clockwise direction. The nozzle bore 3 into the range their tax opening 19 lying in front in line of sight arrives and sends a jet spray 5 diagonally by the bottle delta in the bottle inside. The jet spray 5 meets here under a pointed angle  $\alpha$  full-laminar the jet spray 4 of the front nozzle bore 2, which kept turning itself in the meantime somewhat (Fig. 3c). The jet sprays 4 and 5 lie in a common level, which runs perpendicularly to the axes of rotation of the nozzle waves 7, 8 and lies with small distance parallel to the bottle axle center. Diverts itself within the range of the bottle neck the meeting one another both jet sprays 4, 5 mutually, whereby they swirl and sputter in particular upward. The entire inside of the bottle 6 is generally sprayed to a large extent and moistened, whereby a particularly intensive cleaning results. During meeting one another the two jet sprays 4 and 5 both nozzle waves 7, 8 continue to turn somewhat, whereby the angle  $\alpha$  as well as the point of impact can change. Also this contributes to a particularly intensive cleaning by change of the deflection effect.

The common turn of the two nozzle waves 7, 8 continues to go, until the notice 12 turns out except interference with the Rollenstern 10 of the front nozzle wave 7 and this is stopped by it. In this position the nozzle bore 2 completely outside of its tax opening 18 lies and is switched off thereby while the nozzle bore sends far rotary rear nozzle wave 8 their jet spray 5 into the bottle 6 to 3 that. The jet spray 5 is not now any longer diverted and meets therefore with full energy against the bottle soil and/or. the bottle wall (Fig. 3d). In the further process of the rotation of the rear nozzle wave 8 their jet spray 5 at the bottle wall moves downward (Fig. 3e) until also the notice 12 turns out except interference with the Rollenstern 11 of the rear nozzle wave 8 and stands still these thereby. In this position the nozzle bore 3 completely outside of its tax opening 19 lies and is in the same way switched off like the other nozzle bore 2 thereby.

During the next spraying procedure the same operating period is accomplished 3 by the two nozzle bores 2, in the back-lying in line of sight, which lie again in a common level, which runs with small distance parallel to the bottle axle center. Instead the nozzle bores can be 2, 3 easily diagonally into the nozzle waves 7, 8 trained, so that their jet sprays 4, 5 within the range of the bottle axle center to meet. Also the matching nozzle bores 2 can and/or. 3 in only one level crossing into the nozzle waves 7, 8 to train itself, so that all jet sprays 4, 5 centrically into the bottle 6 to penetrate. In each case with the next spraying procedure again the other mating is subjected to nozzle bores 2, 3 in reverse direction of flow, so that itself possibly. Deposits at the nozzle bores 2, 3 fast replace.



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1. Spraying device for Flaschenreinigungsmaschinen with at least a jet arrangement with at least two nozzle bores, supplyable with liquid, which is able to introduce at the same time several jet sprays in the inside of a bottle, whereby the nozzle bores are trained in at least one swivelling on a Spritzrohr stored nozzle wave, by the fact characterized that the cooperating nozzle bores (2, 3) are trained in in each case their own nozzle wave (7, 8) and are shiftable the nozzle waves (7, 8) in revolution in such a manner that the jet sprays of a jet arrangement (2, 3) are introduced occasionally individually in the inside of a bottle and occasionally inside a bottle to meet one another.
2. Spraying device according to requirement 1, by it characterized that the jet sprays (4, 5) under a pointed angle ( $\alpha$ ) it meets one another.
3. Spraying device according to requirement 2, by the fact characterized that the pointed angle ( $\alpha$ ) changes during a spraying procedure.
4. Spraying device after one of the requirements 1 to 3, by the fact characterized that the jet sprays (4, 5) meet one another with their full cross section.
5. Spraying device after one of the requirements 1 to 4, by the fact characterized that the axle centers of the nozzle bores (2, 3) and the axle center of the bottle (6) lie in a common level.
6. Spraying device after one of the requirements 1 to 5, by the fact characterized that the nozzle waves (7, 8) with the cooperating nozzle bores (2, 3) are swivelling stored with short distance on a common Spritzrohr (9) parallel to each other.
7. Spraying device according to requirement 6, by the fact characterized that each nozzle wave (7, 8) is connected with its own Rollenstern (10, 11), which is shiftable by notices (12) at the bottle promoter (13) in revolution.
8. Spraying device according to requirement 7, by the fact characterized that the Rollensterne (10, 11) are fastened to opposite ends of the nozzle waves (7, 8).
9. Spraying device after one of the requirements 1 to 8, by the fact characterized that the nozzle waves (7, 8) are stored in with tax openings (18, 19) for the nozzle bores (2, 3) provided clevis mountings (16).
10. Spraying device after one of the requirements 1 to 9, by the fact characterized that the jet arrangements (2, 3) are arranged below the path of the bottles (6) with distance to this in the Flaschenreinigungsmaschine.

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